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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/771,749	02/03/2004	Hyoung-Sub Kim	8750-063	3653

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EXAMINER

CAO, PHAT X

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 09/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/771,749

Applicant(s)

KIM, HYOUNG-SUB

Examiner

Phat X. Cao

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 14-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>2/3/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicant's election without traverse of Group I (claims 1-13) in the reply filed on 7/22/05 is acknowledged.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-2, 4-10 and 12-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Ohkawa (US. 6,091,154).

Regarding claims 1, 5, 8 and 9, Ohkawa (Fig. 19C) discloses a semiconductor device comprising: a semiconductor substrate 40 having a cell array region and a peripheral circuit region (column 23, lines 35-39); a plurality of word line patterns 48 placed on the cell array region; a gate pattern 48 placed on the peripheral circuit region; an interlayer insulating layer 63 of BPSG (column 23, lines 30-31) covering an upper surface of the semiconductor substrate 40 having the word line patterns and the gate pattern 48; a self-aligned contact spacer 66 covering a sidewall of the self-aligned contact hole; and gate spacers 60 interposed between sidewalls of the gate pattern 48 and the interlayer insulating layer 63, a width of the gate spacers 60 of 50 to 200 nm (column 23, lines 12-14) being substantially different and greater than from a width of the self-aligned contact spacer 66 of 30 to 100 nm (column 23, lines 1-3).

Regarding claims 2 and 10, Ohkawa (Fig. 19C) further discloses the word line spacers 60 interposed between sidewalls of the word line patterns 48 placed opposite to the self-aligned contact hole 64 and the interlayer insulating layer 63, the word line spacers 60 being formed of the same material layer as the gate spacers 60, the word line spacers 60 having the same width as that of the gate spacers 60.

Regarding claims 4 and 12, Ohkawa (Fig. 19C) further discloses a contact etch stop layer 62 interposed between the word line spacers 60 and the interlayer insulating layer 63, and between the gate spacers 60 and the interlayer insulating layer 63.

Regarding claim 6, Ohkawa (Fig. 19C) also discloses that the self-aligned contact hole 64 includes a lower contact hole formed at a region between the word line patterns 48, and an upper contact hole placed on the lower contact hole and formed to penetrate the interlayer insulating layer 63.

Regarding claims 7 and 13, Ohkawa (Fig. 20C) also discloses that the self-aligned contact hole 51 having the diameter of the lower contact hole is less than that of the upper contact hole in a direction across the word line patterns.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 3 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohkawa (US. 6,091,154) in view of Chang et al (US. 5,817,562).

Ohkawa does not disclose a spacer etch stop layer as claimed.

However, Chang (Fig. 5) teaches the forming of a spacer etch stop layer 24 between the word line spacer 26/28 and one of the two word line patterns 16, between the gate spacer 26/28 and the gate pattern 16, and between the self-aligned contact spacer 30 and the two word line patterns 16. Accordingly, it would have been obvious to modify the device of Ohkawa by forming a spacer etch stop layer with the structures as set forth above because such forming a structure of spacer etch stop layer would stop the etching through the substrate during the forming of the sidewall spacers 26/28, as taught by Chang (see Fig. 4 and column 6, lines 17-25).

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phat X. Cao whose telephone number is 571-272-1703. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on 571-272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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PC
September 16, 2005


PHAT X. CAO
PRIMARY EXAMINER